Jet Propulsion Laboratory
California Institute of Technology

Mars 2020 Project

Mars 2020 Project Status

Mars 2020
1st Landing Site Workshop

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Mission Overview

LAUNCH

- Launch vehicle to be similar class/capability as for MSL
- Period: Jul/Aug 2020

CRUISE/APPROACH

- 7.5 month cruise
- Arrive Feb 2021

ENTRY, DESCENT & LANDING

- MSL EDL system: guided entry and powered descent/Sky Crane
- 25x20km landing ellipse
- Access to landing sites ±30° latitude, ≤0.5 km elevation
- ~950 kg rover

SURFACE MISSION

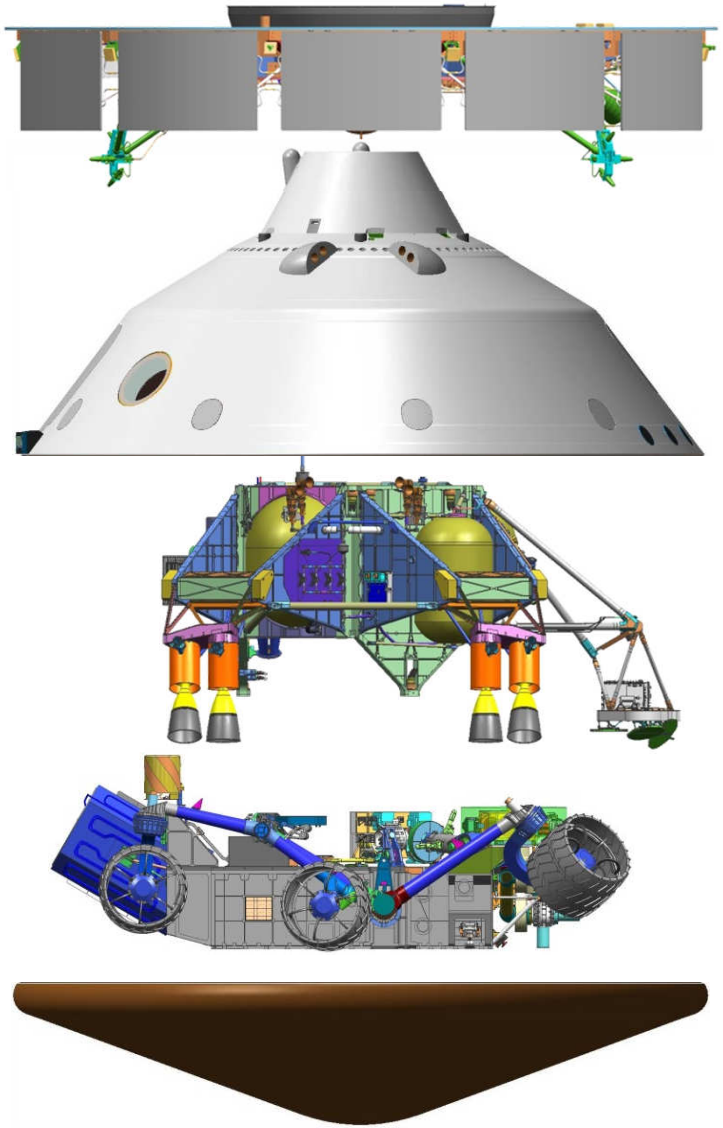
- Prime mission of one Mars year
- 20 km traverse distance capability
- Seeking signs of past life
- Returnable cache of samples
- Prepare for human exploration of Mars

http://mars.jpl.nasa.gov/mars2020/

Mars 2020 Status

- Making excellent progress in Phase A
- AO evaluations proceeding with instrument selection targeted for mid-July
- Project continuing to move ahead with heritage and long-lead builds
  - Capitalizing on maintaining high heritage from MSL
  - Using residual hardware wherever possible
- System Requirements Review / Mission Definition Review targeted for late October

MSL Heritage Flight System Applied to Mars 2020



Cruise Stage Vehicle: Build to print

Backshell/Parachute: Build to print

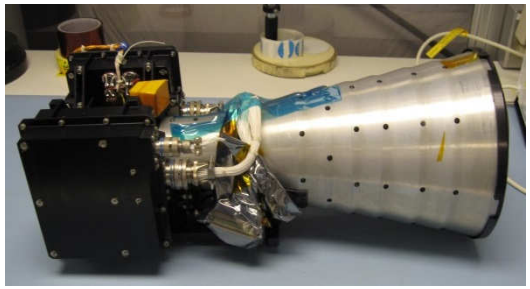
Descent Stage Vehicle: Build to print

Rover: High heritage; Potential changes expected to affect few subsystems

Heatshield: Build to print

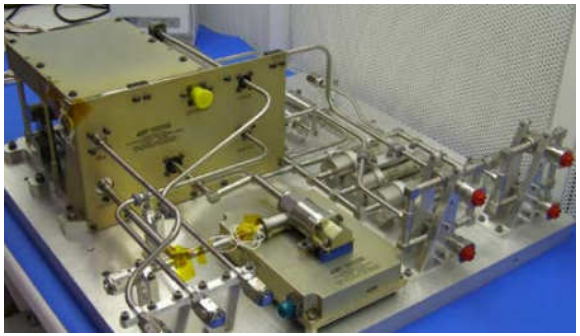
Cruise Stage

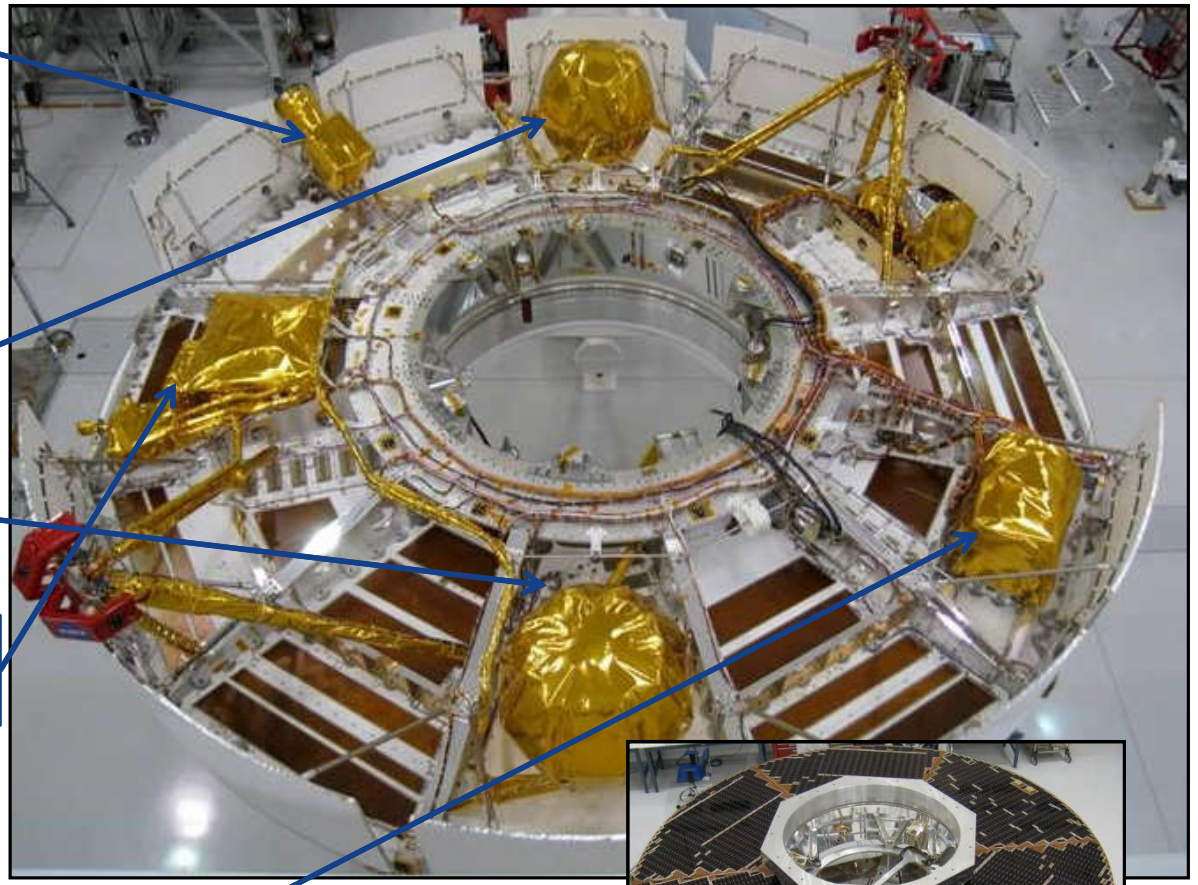
Star Scanners
- Residual HW (under test)



Propellant tanks
- Under contract

Cruise Heat Rejection Pump Assembly
- Under contract





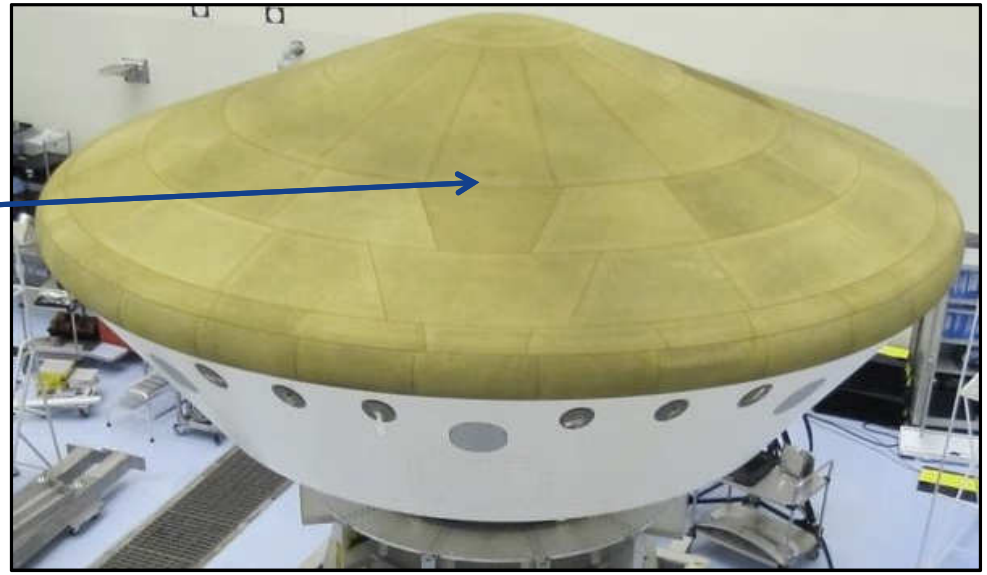
Cruise Power Assembly and Power Analog Modules
- Parts Procured, build begun

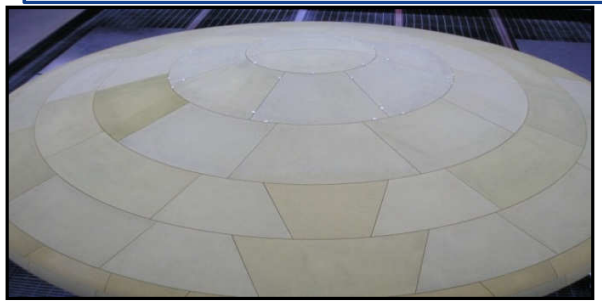
Aeroshell

Heatshield (currently in bldg 179)
- Residual HW

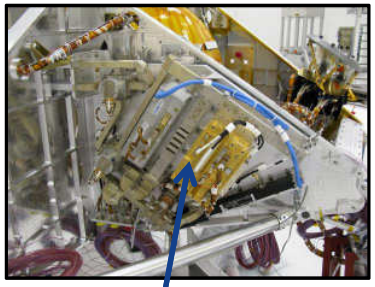
MEDLI-2
- MEDLI reflight approved with some improvements

PICA Tiles
- Residual bulk material in bldg 245
- New material procured (in-hand)
- SWO for machining into tiles on hold

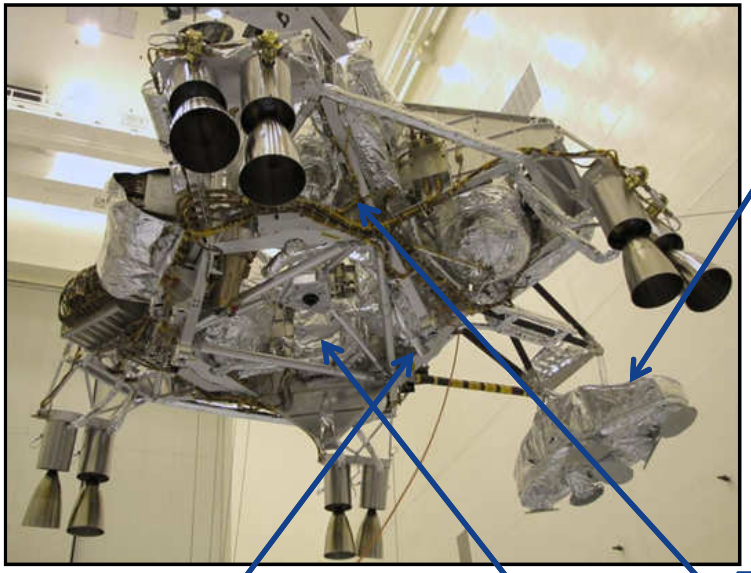




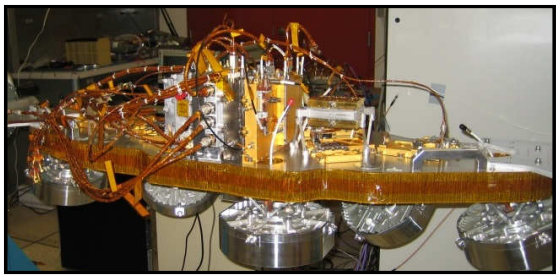
Descent Stage

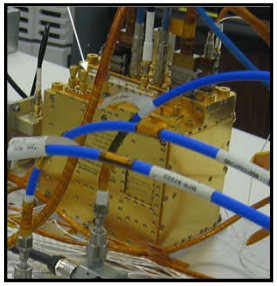


X-band Radio
- Under contract

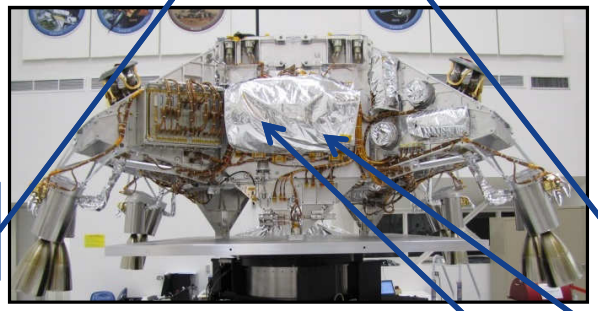


Radar
- Flight Antennas
  - Under contract
- Transmit/Receive Modules
  - Completing MSL build; testing



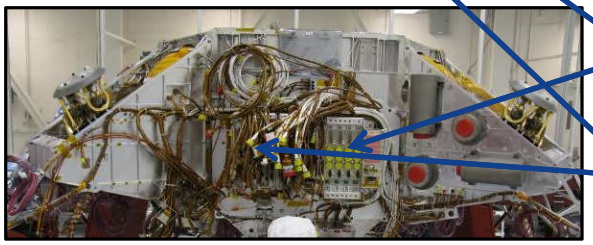


Inertial Measurement Unit
- Contract in negotiation



Primary Structure
- MSL DTM

Descent Stage Brake
- Contract in negotiation



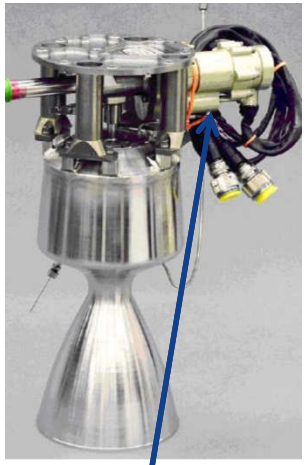
Descent Power Assembly
- Residual flight HW

Descent Power Analog Modules
- Parts Procured, build begun

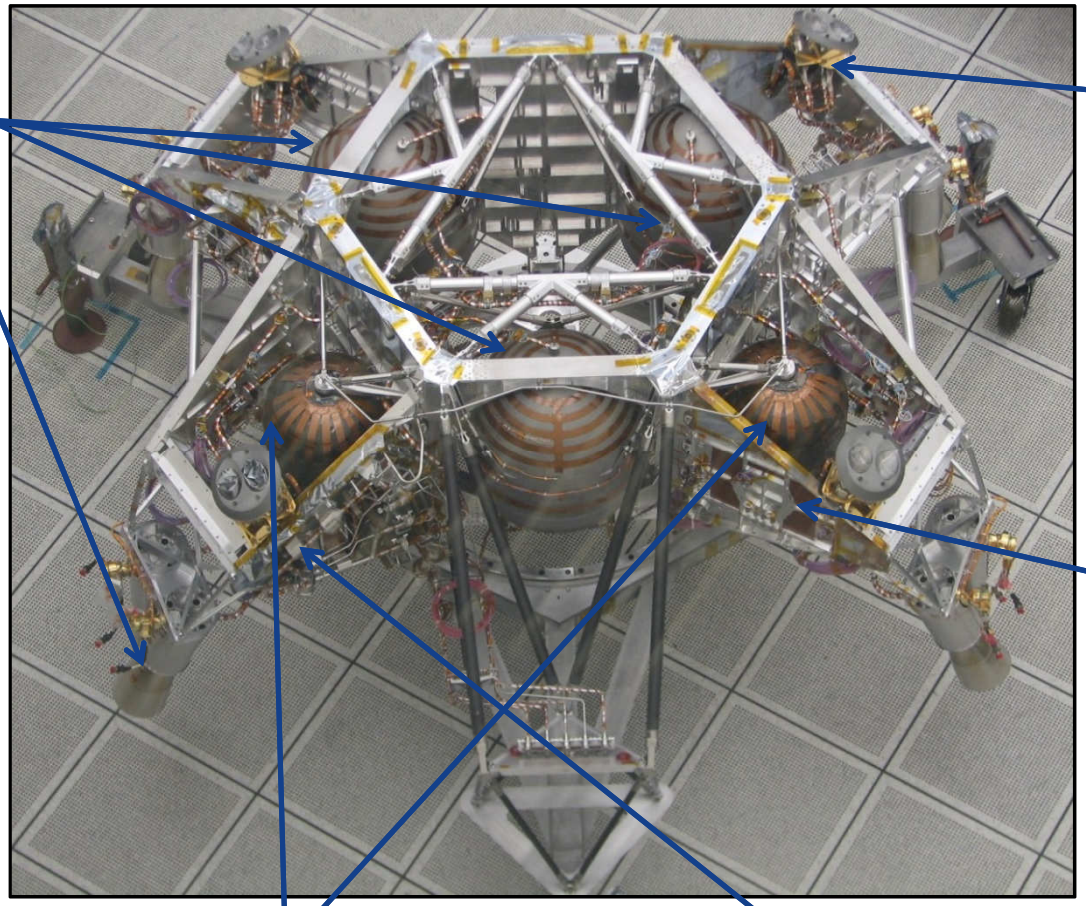
Descent Stage Propulsion

Propellant Tanks
- Under contract

Mars Landing Engines
- Under contract



Throttle Valve
- Under contract



Pressurant Tanks
- Under Contract

HFPR Flight Spares
- Contract in negotiation

DRCS Thrusters and Valves
- Under contract

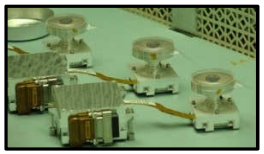
Pyro valves
- Under Contract

Rover

Pyro Firing Assembly
- Residual parts

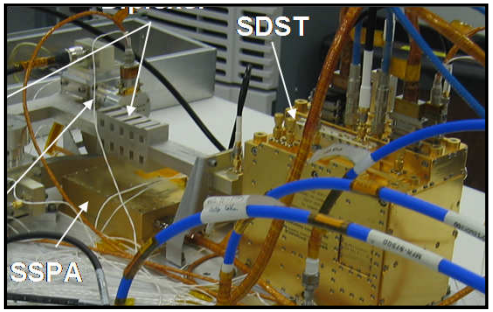
Rover Chassis
- Residual parts

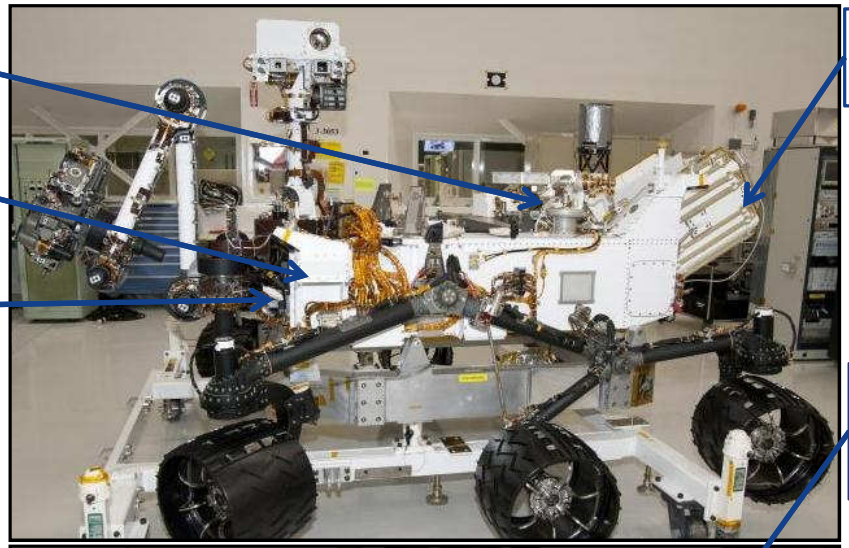
Rover Engineering Cameras
- New build (FMs); MSL residual CCD work begun

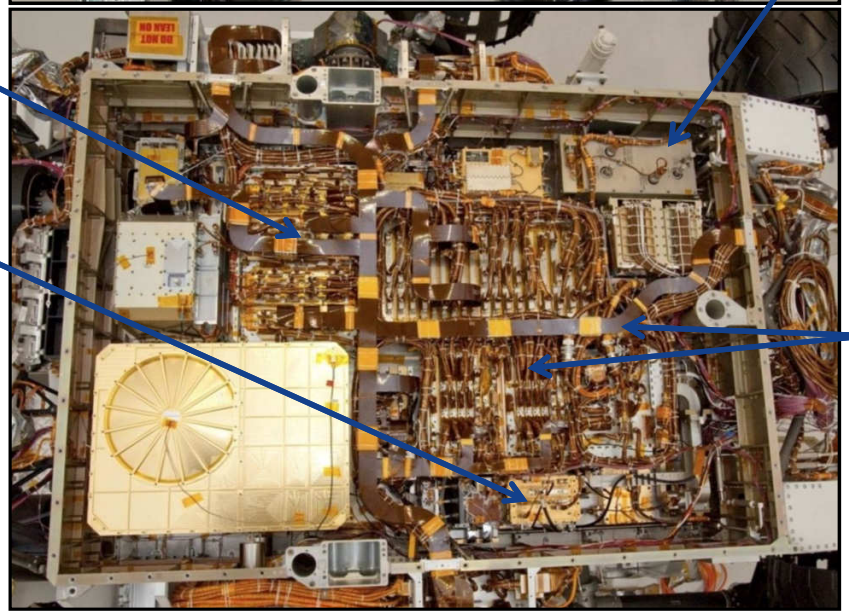


Rover Compute Elements
- Parts Procured, build begun

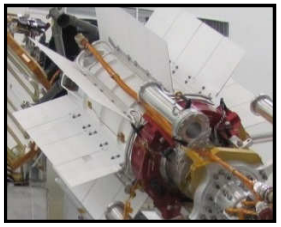
X-band Radio
- Under contract
- Spare MSL unit



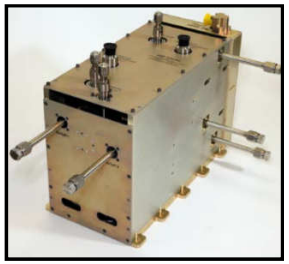




MMRTG
- Residual (F2) flight unit



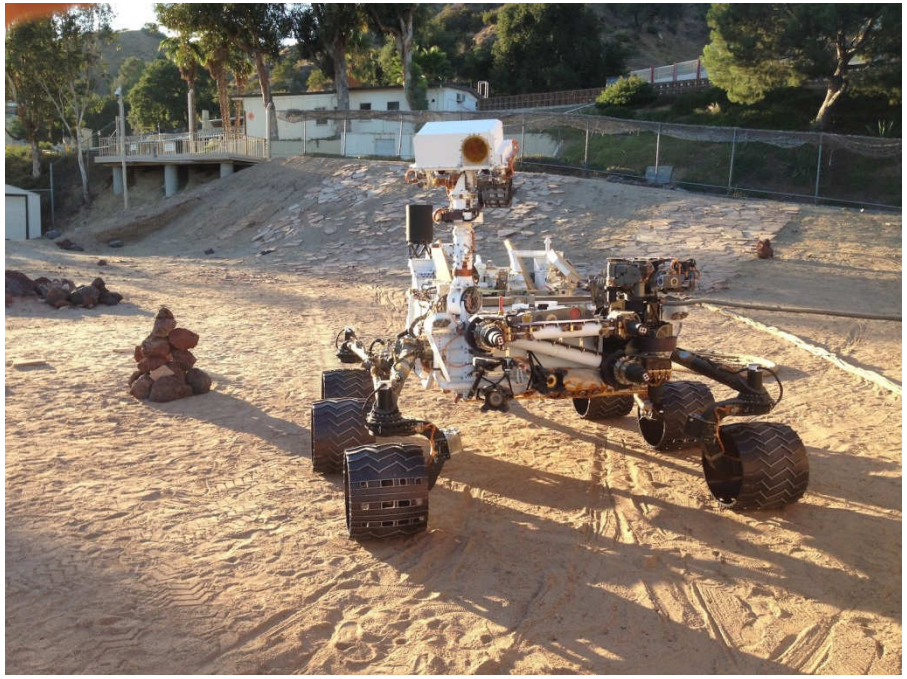
Rover Heat Rejection Pump Assembly
- Under Contract

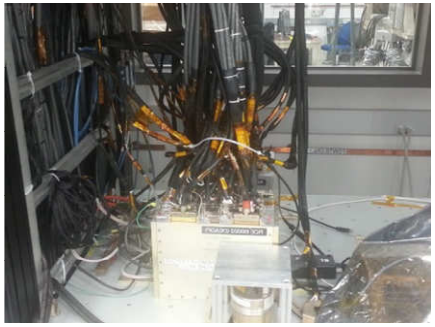


Rover Power Assembly and Power Analog Modules
- Parts Procured, build begun

MSL Testbeds

- Active MSL testbeds will transition to M2020





Mars 2020 Project Summary

- Mars 2020 Project approved for Phase A in November 2013
- The heritage hardware (representing ~90% of the flight system by mass) is essentially in Phase C/D
- Parts buys and procurements for heritage items with low risk of change are proceeding at a fast pace
- The competitive Announcement of Opportunity (AO) for the Mars 2020 payload was released 9/24/13, 58 proposals received on 1/15/14; the targeted selection date is mid-July 2014
- The Phase A work plan is balanced between 1) continued funding to heritage elements in order to buy down obsolescence risk, and 2) significant funding to the new payload elements and the sampling and caching system